2. ENGINEERING PROCESS DIAGRAMS AND CALCULATIONS

The SSSTF T&FR document contains a block flow diagram (Figure 2-1) to show the requirements for the SSSTF. This diagram was used as the basis for the engineering process diagrams presented in this Engineering Design File (EDF). The purpose of the engineering diagrams (a high-level block flow diagram [BFD], decision diagrams, and process flow diagrams [PFDs]) is to initiate and document the engineering design and form a basis for the detailed design documents, such as piping and instrumentation diagrams and facility layout drawings. The legend for the process diagrams is given in Figure 2-1.

The Staging and Storage Annex (SSA), the ICDF landfill, and the ICDF evaporation pond are shown in half tone on the BFD and PFDs. These facilities are outside the scope of the design phase of this project and are shown only to provide clearer definition of the SSSTF processes within the overall ICDF processes. The SSA will become a part of the SSSTF during operations.

2.1 Block Flow Diagram

The engineering BFD, Figure 2-2 (BFD-1) shows the major activities involving the flow of waste through the SSSTF facility. Each block shows an activity, such as storage or treatment, performed on the primary waste streams only. The amount of waste from the transport vehicle decontamination structure is expected to be significant enough to be included on the BFD with incoming waste streams. Items such as secondary waste, empty containers, and raw processing materials are not shown on the BFD.

The flags and lines show each waste stream and its progression through the facility. The waste inputs to the facility are categorized into streams according to processing method instead of waste generator codes to simplify the diagrams and to more easily provide for documenting future changes to waste streams.

2.2 Decision Diagram

A decision diagram provides documentation of activities involved in processing waste in the SSSTF/ICDF that cannot be shown on the BFD or PFDs. The decision diagram for the SSSTF/ICDF waste processes is shown in Figure 2-3. Note, there is not a possibility of getting into an infinite loop of treatment/fail TCLP in the decision matrix. Based on experience at other sites, it is anticipated that treating waste will require at most 2 – 3 times through the process.

2.3 Process Flow Diagrams

In completed form, PFDs provide detailed engineering process design information upon which the physical facility design is based. At the current phase of the SSSTF project, PFDs are approximately 60% complete. These preliminary PFDs (Figures 2-4 through 2-7) expand upon the process shown in the BFD (Figure 2-2), translating activity blocks into facilities and equipment and showing alternate waste stream paths, secondary waste, and raw processing materials as they are currently understood.

Further development of the PFDs will follow approval of the processes documented in this and other EDFs. The diagrams will be continuously updated as part of the engineering design process.

2.4 Process Calculations

The following calculations support the unknowns identified in the T&FR document and the PFDs. Calculations included are incoming waste rates, design processing rates, and manloading estimates.

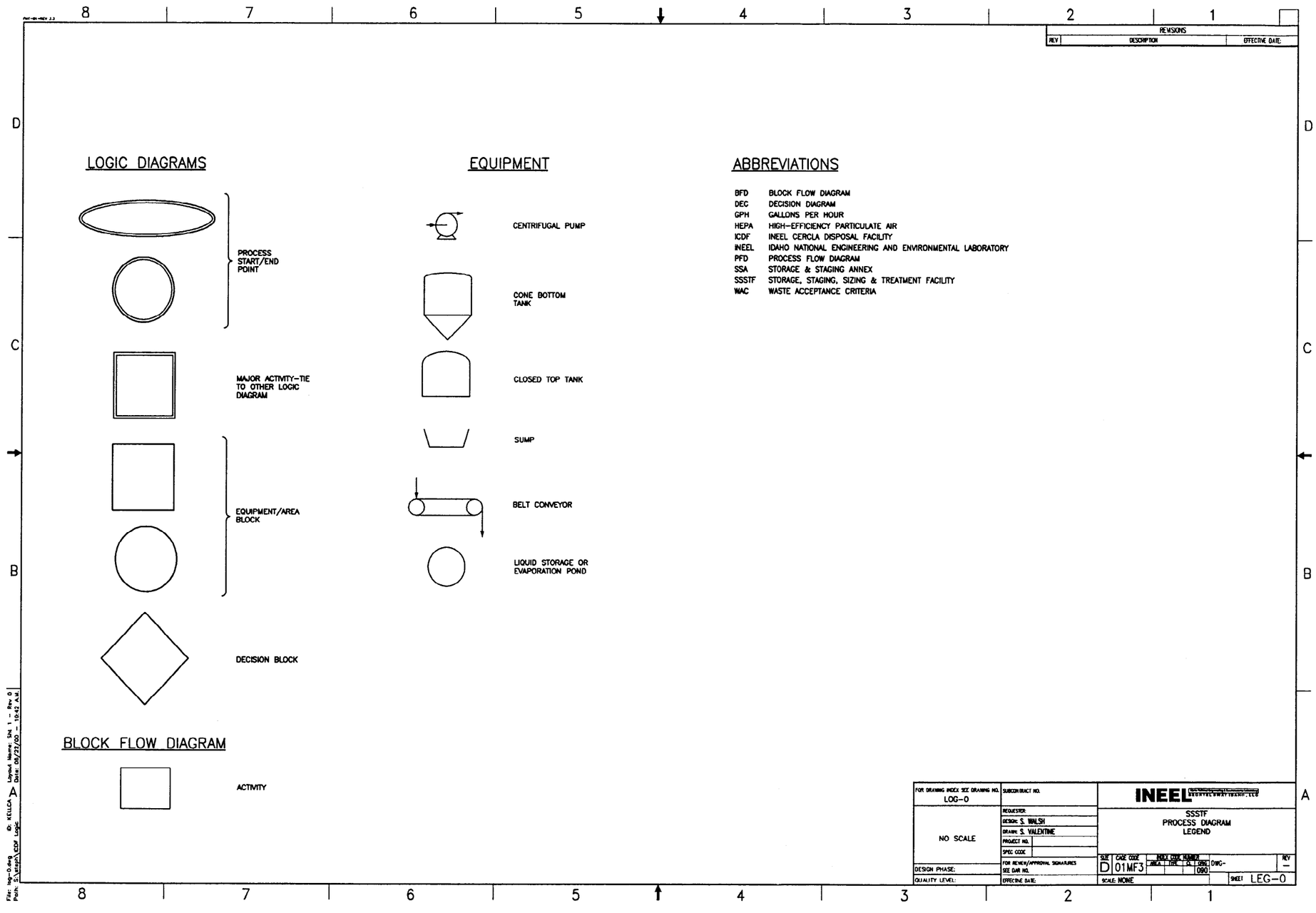


Figure 2-1. SSSTF Process Diagram Legend.

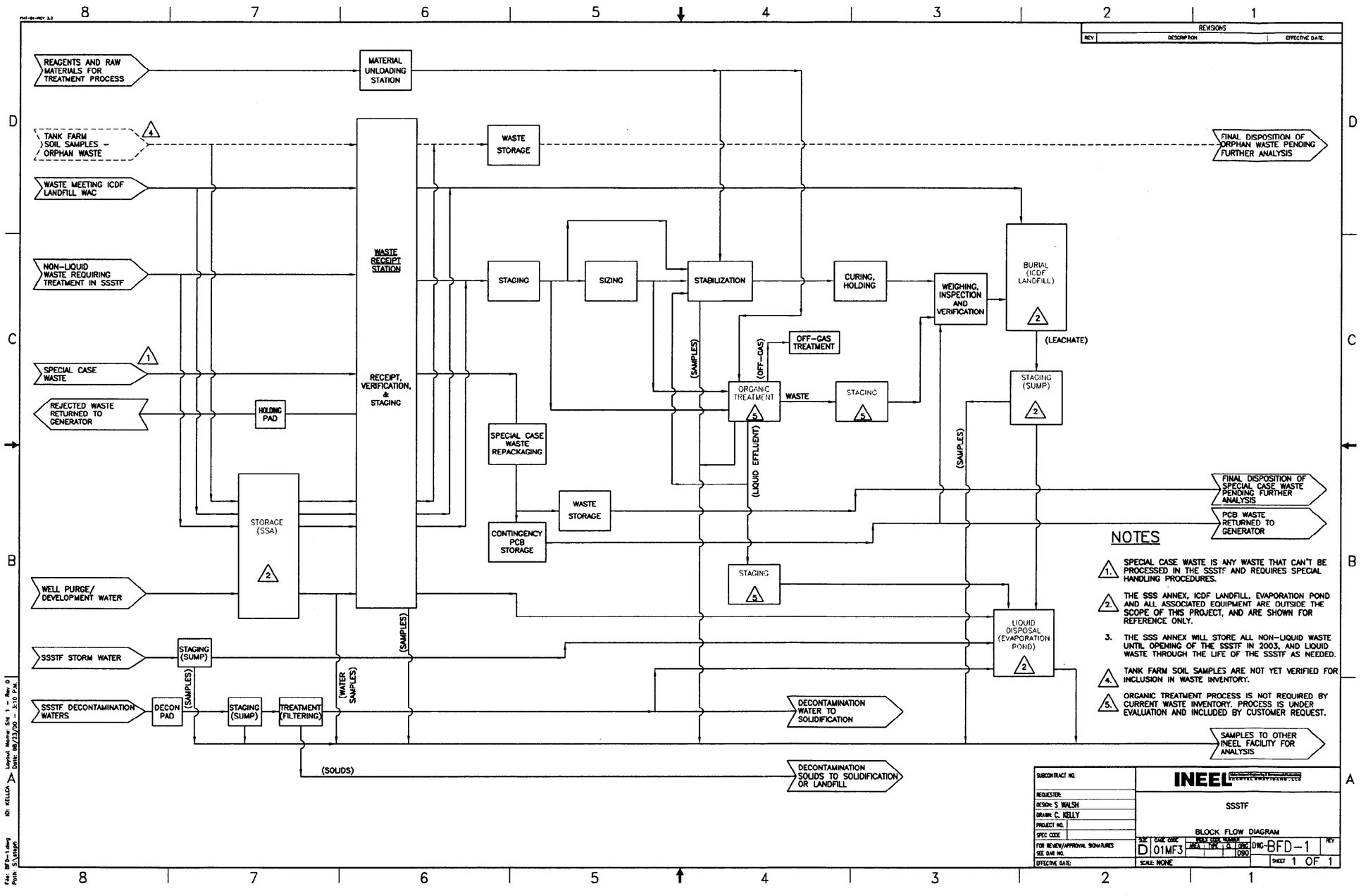


Figure 2-2. SSSTF Engineering Block Flow Diagram.

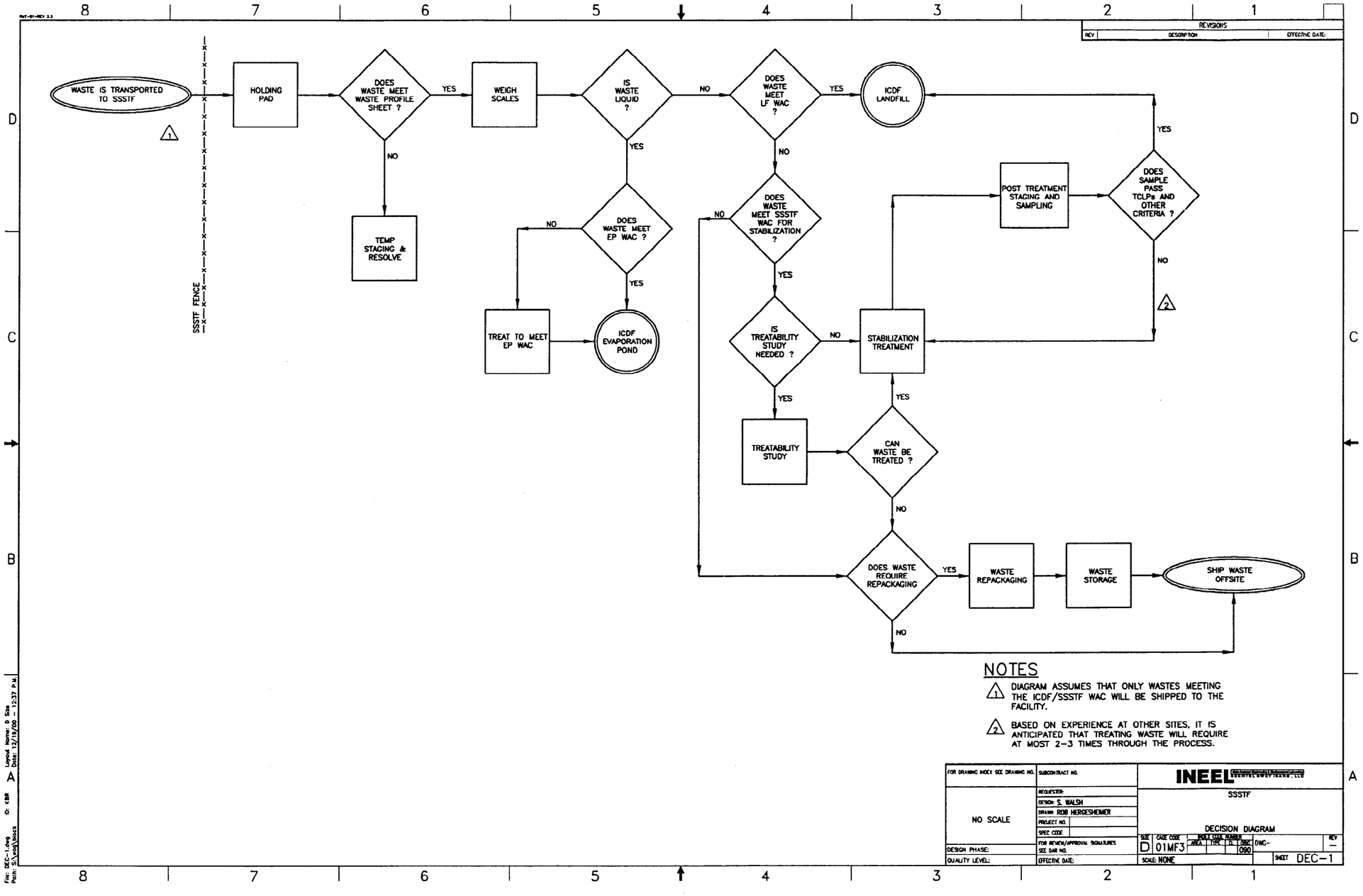
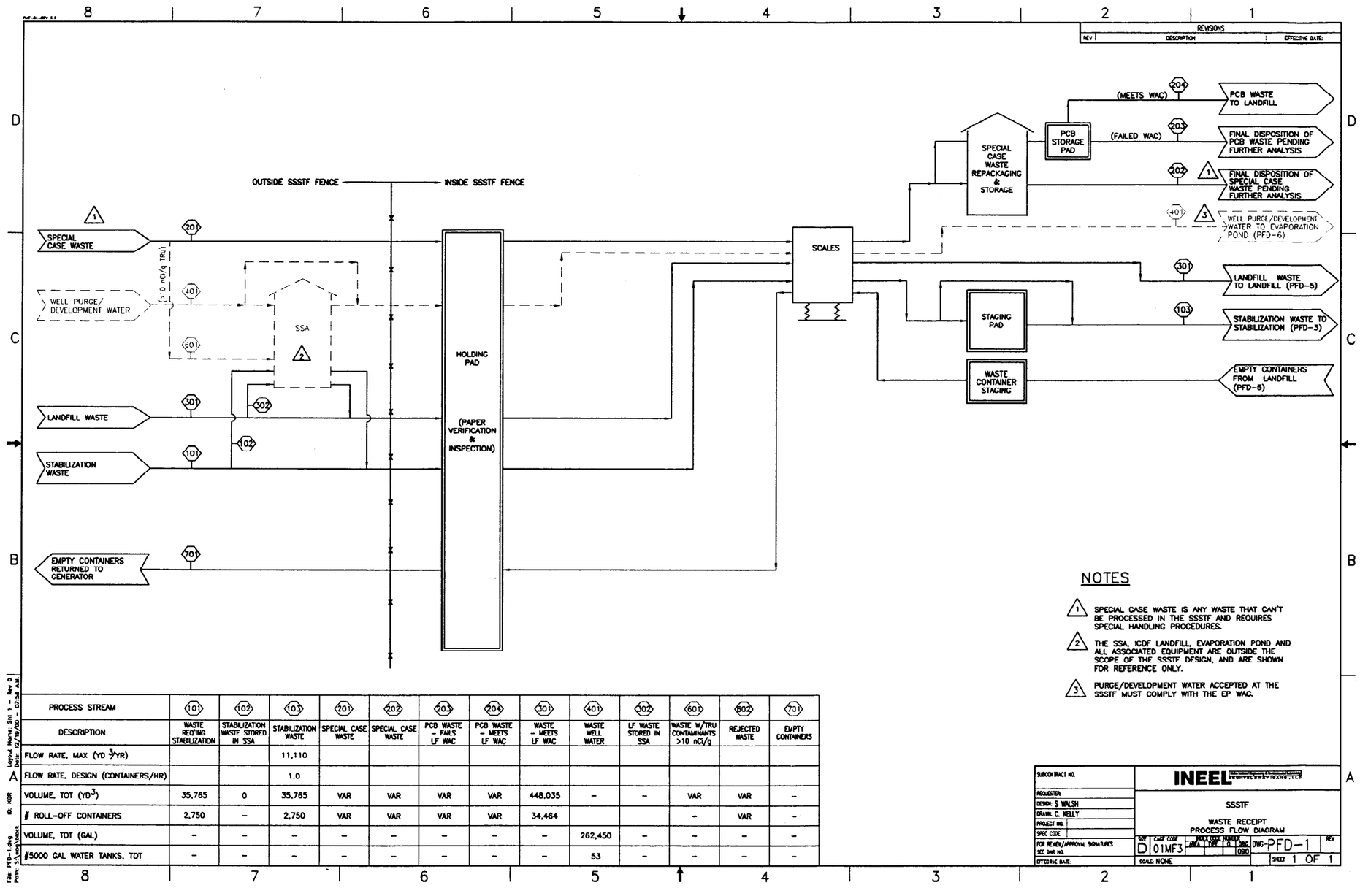


Figure 2-3. SSSTF Decision Diagram.



PROCESS STREAM	101	102	103	201	202	203	204	301	401	302	601	602	701
DESCRIPTION	WASTE REQ'ING STABILIZATION	STABILIZATION WASTE STORED IN SSA	STABILIZATION WASTE	SPECIAL CASE WASTE	SPECIAL CASE WASTE	PCB WASTE – FAILS LF WAC	PCB WASTE – MEETS LF WAC	WASTE – MEETS LF WAC	WASTE WELL WATER	LF WASTE STORED IN SSA	WASTE W/TRU CONTAMINANTS >10 nCi/g	REJECTED WASTE	EMPTY CONTAINERS
FLOW RATE, MAX (YD^3/YR)			11,110										
FLOW RATE, DESIGN (CONTAINERS/HR)			1.0										
VOLUME, TOT (YD^3)	35,765	0	35,765	VAR	VAR	VAR	VAR	448.035	–	–	VAR	VAR	–
# ROLL-OFF CONTAINERS	2,750	–	2,750	VAR	VAR	VAR	VAR	34,464			–	VAR	–
VOLUME, TOT (GAL)	–	–	–	–	–	–	–	–	262,450	–	–	–	–
#5000 GAL WATER TANKS, TOT	–	–	–	–	–	–	–	–	53	–	–	–	–

NOTES

1. SPECIAL CASE WASTE IS ANY WASTE THAT CAN'T BE PROCESSED IN THE SSSTF AND REQUIRES SPECIAL HANDLING PROCEDURES.
2. THE SSA, ICDF LANDFILL, EVAPORATION POND AND ALL ASSOCIATED EQUIPMENT ARE OUTSIDE THE SCOPE OF THE SSSTF DESIGN, AND ARE SHOWN FOR REFERENCE ONLY.
3. PURGE/DEVELOPMENT WATER ACCEPTED AT THE SSSTF MUST COMPLY WITH THE EP WAC.

INEEL
SSSTF
WASTE RECEIPT
PROCESS FLOW DIAGRAM
SIZE D | CAGE CODE 01MF3 | DWG-PFD-1 | REV
SCALE: NONE | SHEET 1 OF 1

Figure 2-4. SSSTF Waste Receipt Process Flow Diagram.

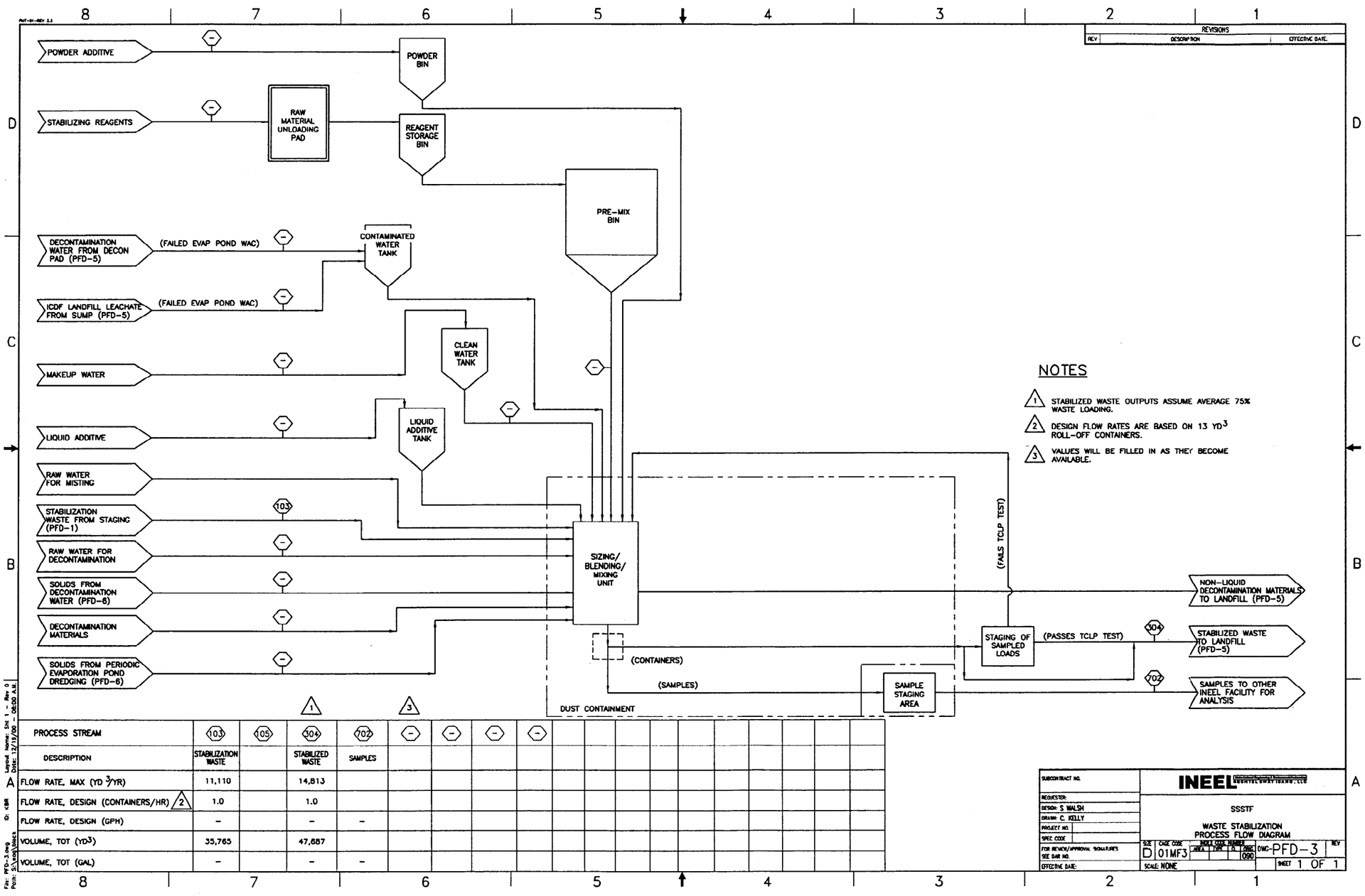


Figure 2-5. SSSTF Stabilization Process Flow Diagram.

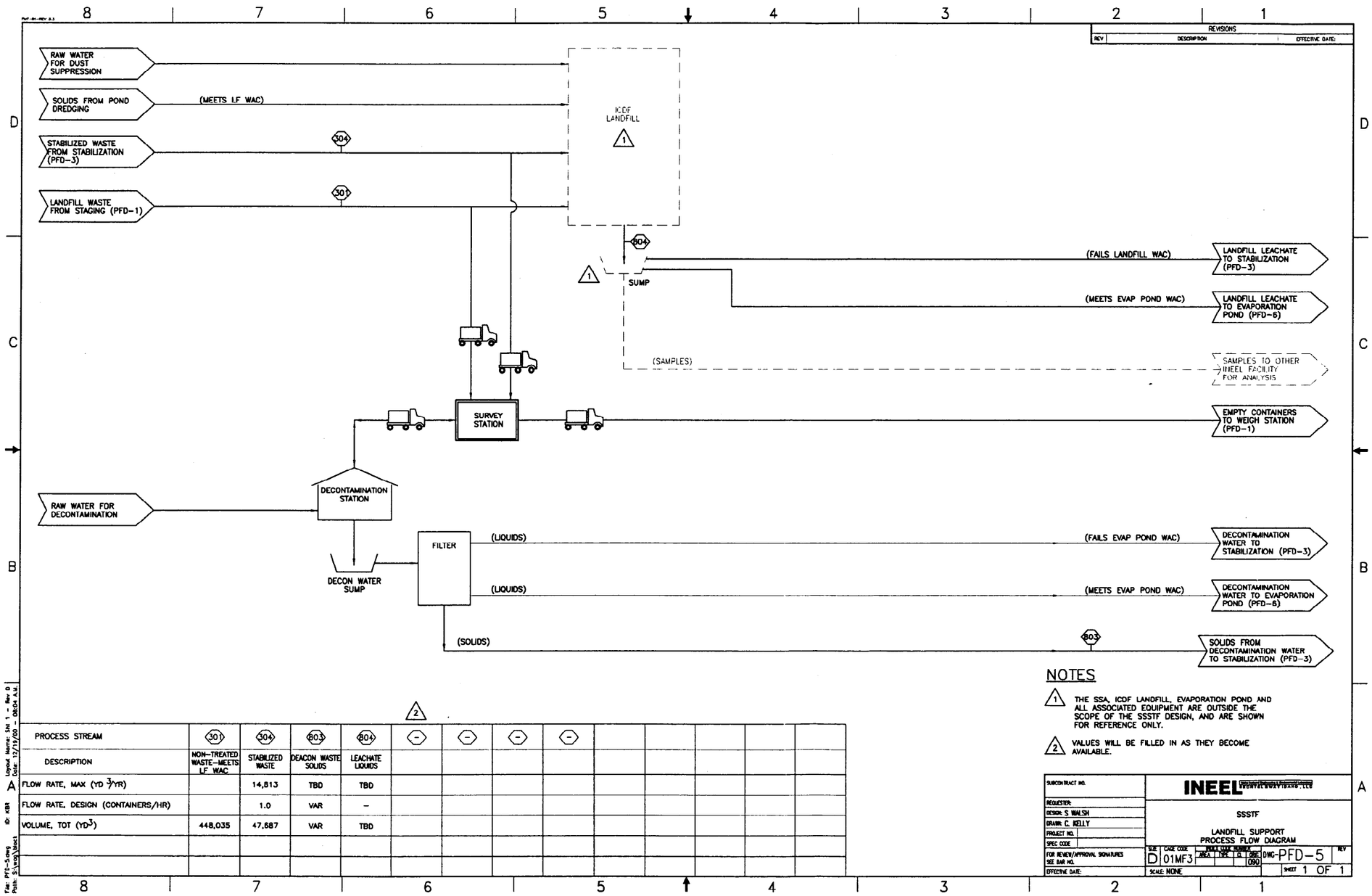


Figure 2-6. SSSTF/ICDF Landfill Process Flow Diagram.

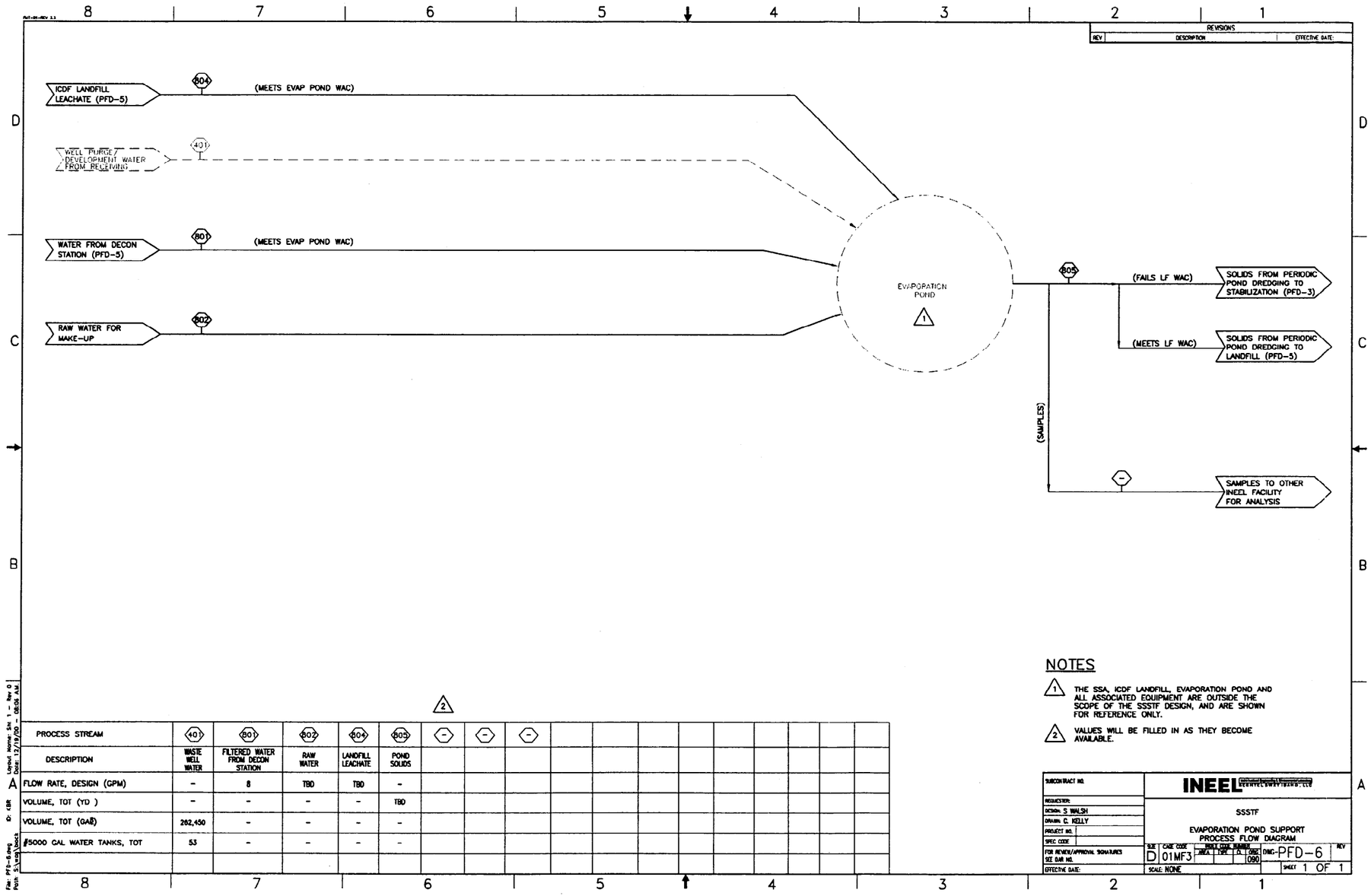


Figure 2-7. SSSTF/ICDF Evaporation Pond Support Process Flow Diagram.